

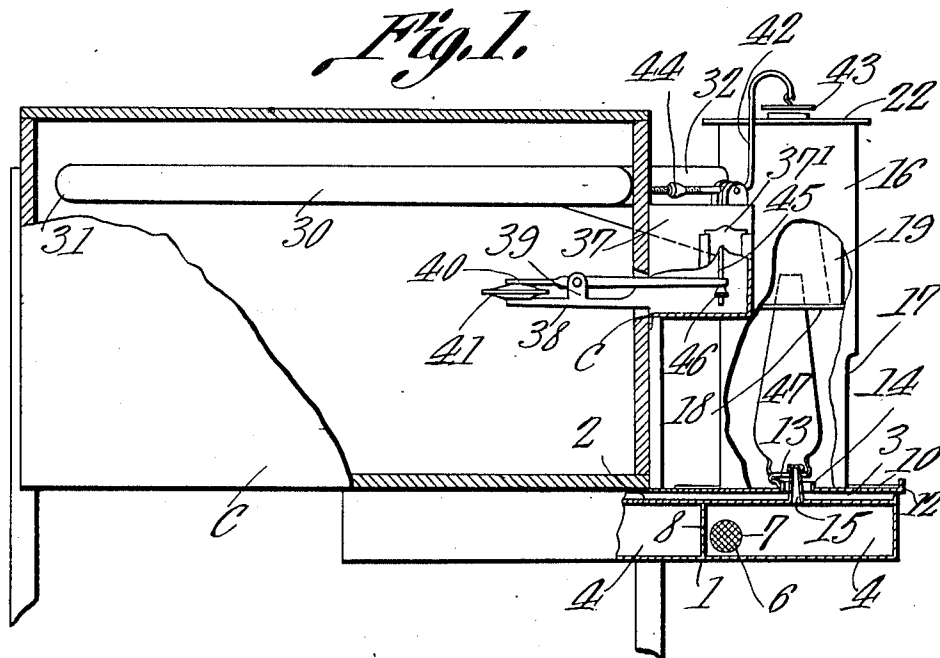
1,020,720.

W. E. SMITH.  
INCUBATOR.  
APPLICATION FILED NOV. 15, 1910.

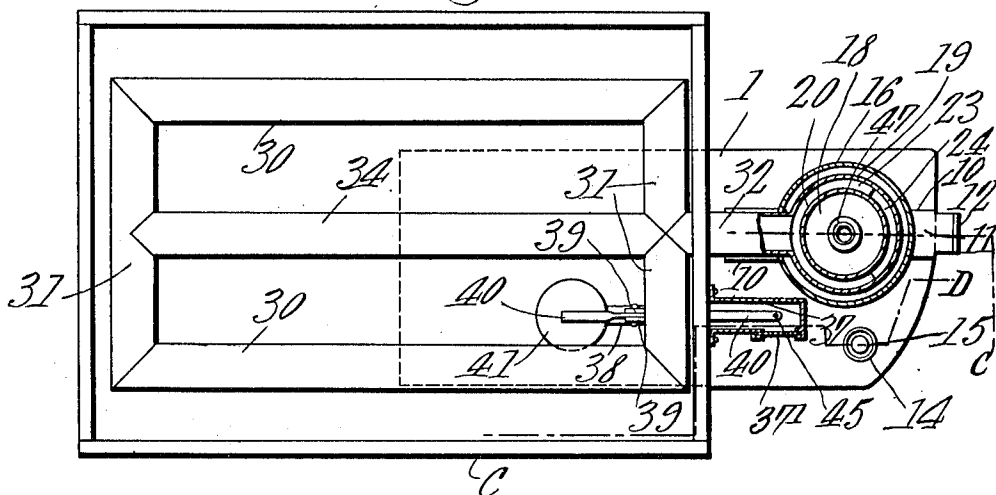
Patented Mar. 19, 1912.

2 SHEETS-SHEET 1.

*Fig. 1.*



*Fig. 2.*



Witnesses

*J. E. Smith*  
*Herbert D. Lawson*

*Walter E. Smith,*  
Inventor

by *C. A. Snow & Co.*  
Attorneys

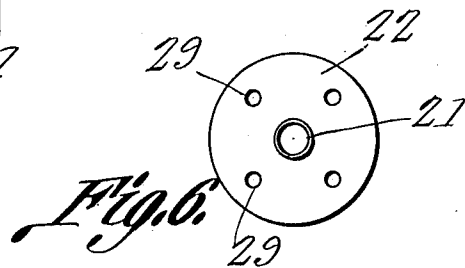
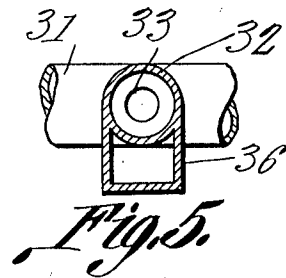
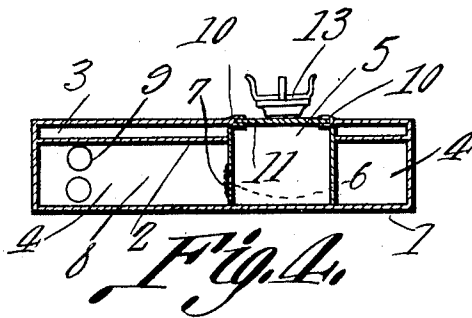
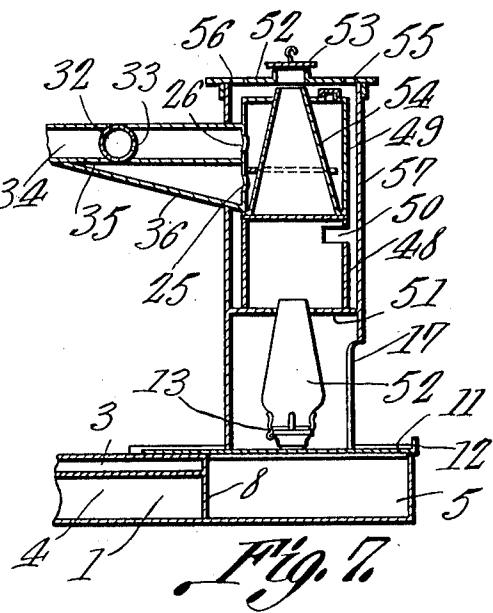
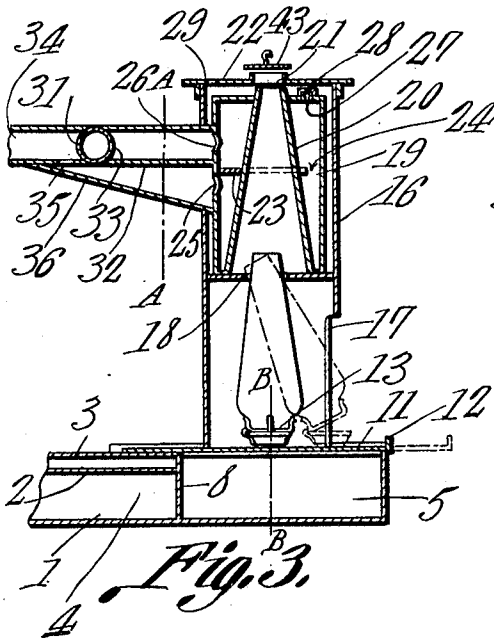
W. E. SMITH.  
INCUBATOR.

APPLICATION FILED NOV. 15, 1910.

Patented Mar. 19, 1912.

2 SHEETS-SHEET 2.

1,020,720.



Witnesses

*J. D. Conlin*  
*Herbert A. Lawson*

*Walter E. Smith,*

Inventor

by *C. A. Snow & Co.*  
Attorneys

# UNITED STATES PATENT OFFICE.

WALTER ERNEST SMITH, OF CLAY CENTER, KANSAS.

## INCUBATOR.

1,020,720.

Specification of Letters Patent.

Patented Mar. 19, 1912.

Application filed November 15, 1910. Serial No. 592,528.

*To all whom it may concern:*

Be it known that I, WALTER E. SMITH, a citizen of the United States, residing at Clay Center, in the county of Clay and State of Kansas, have invented a new and useful Incubator, of which the following is a specification.

This invention relates to incubators and more especially to heating apparatus for use in connection therewith. One of its objects is to provide a heater including an oil reservoir on which the heating burner is movably mounted, said burner being slidable into or out of position below the boiler without the necessity of removing it from the reservoir or of shifting the reservoir, this movement of the burner being such as to expose the wick at a point where it can be readily trimmed.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings, the preferred forms of the invention have been shown.

In the drawings,—Figure 1 is a view partly in side elevation and partly in section of an incubator having the present improvements applied thereto, the oil receptacle or reservoir being shown in section on the line D Fig. 2. Fig. 2 is a horizontal section through the boiler, the thermostat-supporting casing and the radiator being shown in plan. Fig. 3 is a central vertical section through the boiler and through the reservoir of the burner, a portion of the radiator being shown in section, said section taken on the line C Fig. 2. Fig. 4 is a section through the reservoir on line B of Fig. 3, the burner being shown in elevation. Fig. 5 is a section on line A Fig. 3. Fig. 6 is a plan view of the housing, the damper being removed. Fig. 7 is a view similar to Fig. 3 but showing a slightly modified form of heater.

Referring to the figures by characters of

reference C designates the casing of the incubator and one wall of the casing has a slot *c* for the reception of portions of the heat regulating mechanism. An elongated casing 1 extends under, and is secured in any preferred manner to the casing C and is divided, by a horizontal partition 2, into an upper compartment 3 and a lower compartment 4, this last mentioned compartment constituting an oil reservoir while the upper compartment 3 constitutes a receptacle for water. An elongated trough 5 is formed within the casing 1 and extends from the top to the bottom thereof, the interior of this trough being out of communication with the compartment 3 but communicating with the compartment 4 through one or more openings 6 each of which is provided with a screen 7 designed to prevent the admission of dirt or other foreign substance to the trough 5 from the compartment 4. The casing 1 may be reinforced transversely at a point between its ends by a partition 8 which may have a desired number of openings therein, as shown at 9 so as to permit the liquid contents of the casing to freely circulate through the partition. This partition serves to tie the top and the bottom of the compartment 4 together and prevent them from buckling.

Guide cleats 10 are formed upon the top of the casing 1 at opposite sides of the trough 5 and a slide 11 is mounted within them and constitutes a closure for the trough. This slide has a finger piece 12 at one end whereby the same can be readily actuated, and a burner 13 is mounted on the slide so that its wick can hang freely in the trough.

A water inlet opening 14 is formed in the top of the casing 1 and an oil inlet tube 15 extends through this opening and from the partition 2. This opening and the tube are located at one side of the burner 13, as clearly indicated in Fig. 2.

A cylindrical housing 16 is secured upon and extends upwardly from the casing 1 and bridges the slide 11 and trough 5, there being an opening 17 in the bottom portion of the housing and over the slide, this opening being sufficiently large to permit the burner 13 to pass outwardly therethrough when the slide 11 is drawn longitudinally upon the

casing. A supporting ring 18 is secured within the housing 16 at a point above the opening 17. This ring constitutes the support of the cylindrical boiler 19 which is completely housed within the upper portion of the housing 16 and has a frusto-conical flue 20 centrally arranged therein, the upper or small end of the flue projecting above the top of the boiler and close to a central outlet opening 21 formed in the removable top 22 of the housing. A deflecting plate or partition 23 is arranged within the boiler and extends almost entirely around the flue 20, there being a passage 24 between the ends of this plate and which is located at a point remote from the inlet port 25 of the boiler. This inlet port is arranged below the plate 23 and an outlet port 26 is arranged above said plate and directly over the port 25. The boiler 19 is adapted to be filled through an orifice which is formed in the top thereof and which is normally closed, as by means of a cap 28. The top or cover 22 of the housing 16 has a series of small openings 29 adjacent the periphery thereof. These openings are located above the space which is formed between the housing and the boiler.

The radiator used in connection with the boiler is adapted to be supported within the upper portion of the casing C and consists of a rectangular frame made up of communicating side and end pipes 30 and 31, respectively. An outlet tube 32 extends from the boiler 19 and opens thereinto through the outlet port 26, this pipe extending, and being soldered or otherwise secured to the middle portion of one of the end pipes 31, said end pipe having an opening 33 through which communication is established between said pipes 31 and 32. A return pipe 34 is interposed between and secured to the middle portions of the two end pipes 31 and communicates, at one end, with the interior of that pipe 31 which is remote from the pipe 32. The other end of pipe 34 is closed. There is, however, an outlet opening 35 in the bottom of pipe 34 close to the closed end thereof, and a box-like extension 36 is arranged under and secured to the pipes 32 and 34 and opens into the port 25 and the aperture 35. It will be apparent, from the foregoing, that hot water upon leaving the boiler through the port 26, will flow, by way of pipe 32, to the near pipe 31 and thence in both directions through the said pipe to the side pipes 30 and the remote pipe 31 from which it will return, through pipe 34 to box 36 and thence through port 25 to the bottom portion of the boiler. Importance is attached to the fact that the extension or box 36 projects under the pipe 31 in which the opening 33 is formed, this extension thus not only constituting part of the return pipe of the radiator, but also serving to brace the radiator at its weakest

point, to-wit, where the three pipes 32, 31 and 34 are soldered together.

A box-like casing 37 is secured to the slotted wall of the casing C and extends across the slot, this housing or casing 37 having an arm 38 extending therefrom and through the slot *c*. Said arm has one or more ears 39 projecting upwardly therefrom and supporting a lever 40. A thermostat wafer 41 is interposed between and secured to the ends of arm 38 and lever 40 and said lever projects through the slot *c* and into the casing 37. A damper lever 42 is fulcrumed upon the top of casing 37 and carries a damper 43 at one end, while its other end is screw-threaded and has a weight 44 adjustable thereon. A screw-threaded rod 45 is pivotally connected to the lever 42 at a point between its fulcrum and the weight 44 and projects downwardly into casing 37 and loosely engages the lever 40, there being an adjustable device, such as a nut 46, engaging the rod 45 and constituting a support for the lever.

It is to be understood that, under normal conditions, the wafer 41 is collapsed and the damper 43 is resting on the top 22 so as to close the opening 21. After the compartments 3 and 4 of casing 1 have been filled in the manner hereinbefore described and water has been poured into the boiler 19 through the opening 27, a chimney, such as shown for example at 47, is inserted upwardly into the ring 18 and placed, at its lower end upon the burner 13. Slide 11 is then pulled outwardly so as to move the burner through the opening 17, this action causing the upper end of the chimney to strike the ring 18 and the entire chimney to thus tilt relative to the burner and, therefore, expose the wick. The slide 11 is of such length as to keep the trough 5 closed while the burner is located outside of the housing 16. With the wick exposed, as above stated, the same can be readily ignited and, by pushing the slide back to its initial position, the burner will be moved back into the housing 16 and the chimney 47 returned to its upright position within the housing. It will be apparent that, when the slide is drawn outwardly, the wick will be moved therewith longitudinally of the trough and will remain constantly at the same depth within the trough and will not be pulled out of the fuel as would be the case should such sliding movement of the burner result in pulling the wick upwardly from the trough. The products of combustion, after leaving the chimney 47, will pass upwardly through the flue 20 and will be spread horizontally by the cover 22, a portion of these products passing around the boiler and between it and the housing and all of the products finally escaping through the outlet openings 29. The boiler will thus be heated

both along the flue and along its exterior surfaces and the temperature of the water contained therein will soon be raised to a desired degree. The water, upon being  
 5 heated, will circulate from the boiler, through the radiator and back into the inlet port 25, the direct upward movement of the water from this port 25 to the port 26 being prevented by the deflecting plate or  
 10 partition 23. When the temperature within the casing C rises to a predetermined degree, the wafer 41 will be expanded to such an extent as to cause the lever 40 to pull downwardly on lever 42 and therefore lift  
 15 the damper 43 off of the top 22. The products of combustion will therefore be free to pass directly from the chimney 47 to the outlet opening 21 and the water contained within the boiler and radiator will therefore  
 20 quickly cool so as to reduce the temperature of the air confined within the casing C.

Attention is directed to the fact that the thermostat and all of the parts operated thereby and connected thereto are supported  
 25 by the casing 37 which is arranged outside of casing C. By mounting all of these controlling parts upon the one object, they are not affected by changes in temperature as is often the case where, for example, the arm  
 30 supporting the thermostat is attached to a wall of casing C, while the lever operated by said thermostat is attached to another structure. The difference in expansion of the two parts due to the fact that they are  
 35 exposed to different temperatures, often results in the actuation of the damper when such actuation is not desired.

In Fig. 7 has been shown a heater which differs slightly from that shown in the other  
 40 figures of the drawing. This heater has a drum 48 extending downwardly from the boiler 49 and provided, close to the bottom of the boiler, with an outlet 50 for the products of combustion. A flange 51 extends in-  
 45 wardly from the bottom portion of this drum and surrounds the upper end of the chimney 52. In this form of device, when the damper 53 is closed, the products of combustion, instead of passing upwardly  
 50 through the conical flue 54, will pass outwardly through the port 50 and thence along the outer side of the boiler to the outlet openings 55 in the top 56 of the housing 57. In  
 55 other respects this modified form of heater is the same as the heater heretofore described.

While the heat distributing system has been described and illustrated in the present case it is to be understood that the same con-  
 60 stitutes no part of the present invention but constitutes the subject matter of a divisional application filed by me on March 30, 1911, Serial No. 617,861.

By providing the compartment 3 above  
 65 the oil reservoir in casing 1, the transmis-

sion of heat from the burner to the oil is practically prevented, said oil being maintained cool at all times. Moreover this water, which extends between the oil reservoir and the bottom of the casing C prevents  
 70 the oil, should it become heated, from heating the interior of the casing to an undesirable extent.

It will be noted that, by utilizing the  
 75 trough 5, the wick of the burner is maintained constantly within the oil contained within the trough and irrespective of the movement of the slide 11 relative to the trough.

By referring to Fig. 1 it will be noted  
 80 that the casing 37 has a door 37' slidably mounted thereon. By opening this door access may be conveniently had to the rod 45 and nut 46 for the purpose of adjusting  
 85 said rod relative to the lever 40.

What is claimed is:—

1. A heater for incubators and the like including an oil reservoir, a trough therein and communicating therewith, a boiler fixedly supported above the reservoir, and a  
 90 burner slidable longitudinally of the trough and into and out of position below the boiler, the wick of this burner being adapted to extend constantly into the trough.

2. In a heater, a reservoir having an  
 95 elongated wick-receiving trough communicating therewith, a boiler supported thereabove, a longitudinally movable closure upon the trough, and a burner carried by the  
 100 closure and slidable therewith into or out of position below the boiler, the wick being movable longitudinally of the trough and constantly at the same depth during such movement of the closure.

3. A heater including a fuel reservoir  
 105 having a wick-receiving trough opening thereinto, a boiler supported above the reservoir, a trough closure, a burner thereon, said closure being slidable to move the  
 110 burner into or out of position under the boiler, a chimney movably connected to the burner, and means upon the boiler and cooperating with the chimney for tilting said chimney to expose the burner when said  
 115 burner is moved from under the boiler.

4. The combination with a fuel reservoir, a housing upstanding therefrom, and a boiler within the housing, said housing having an opening, of a trough within and communicating with the reservoir, a closure  
 120 movably mounted above the trough, a burner thereon, the wick of said burner being extended into the trough, said closure being slidable to bring the burner through the opening in the housing, a chimney mov-  
 125 ably connected to the burner, and means cooperating therewith for tilting the chimney and exposing the burner when slid outwardly through the opening in the housing.

5. In a heater, an oil reservoir having an  
 130

elongated opening, a boiler supported above  
said reservoir, a burner movable longitudi-  
nally of the opening and into or out of posi-  
tion below the boiler, the wick of the burner  
5 being movable with the burner and in the  
reservoir and constantly at the same depth  
during such movement.

In testimony that I claim the foregoing  
as my own, I have hereto affixed my signa-  
ture in the presence of two witnesses.

WALTER ERNEST SMITH

Witnesses:

HY. W. STACKPOLE,  
E. MAGILL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,  
Washington, D. C."